Synthesis of Pyrrolidinones via \(\alpha,\beta\)-Unsaturated Acylammonium Ions

**Significance:** An asymmetric enantioselective Michael addition–proton transfer–lactamization or lactonization organocascade reaction is reported. The cinchona alkaloid derived catalysts 1 can generate chiral \(\alpha,\beta\)-unsaturated acylammonium salts with crotonyl chlorides 2, giving pyrrolidinones, piperid-2-ones, and dihydropyridinones in good yields and high enantioselectivities.

**Comment:** In the first step, the lithiated enolate is formed to participate in a conjugate addition to the acylammonium species, which derives from reaction of the chiral tertiary amine \(R_3N\) with the acid chloride. After an intra- or intermolecular proton transfer, the acylammonium species undergoes intramolecular lactamization to regenerate the tertiary amine catalyst \(R_3N\). The products could be transformed into known precursors of various biologically active compounds.